Strategy Research Project

Transforming the Czech Armed Forces to Information Age Warfare

by

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USAWC STRATEGY RESEARCH PROJECT

TRANSFORMING THE CZECH ARMED FORCES TO INFORMATION AGE WARFARE

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TRANSFOMING THE CZECH ARMED FORCES TO INFORMATION AGE WARFARE

> … we consider Networked Enabled Capability as a fundamental prerequisite to achieve final goals of the transformation of the professional Czech armed forces and achieving final operational capabilities of the Czech armed forces for participating in a full spectrum of allied and coalition operations within the range of approved national political-military ambitions of the Czech Republic.[1]
>
> —Gen. Vlastimil Picek
> The Chief of the General Staff of the Czech Armed Forces

In 2007, the Czech armed forces (ACR) published the Strategy for Networked Enabled Capability of the Czech Armed Forces (SFNEC). This document details the goals, priorities, guidelines and procedures for implementing NEC in the ACR. The strategy incorporated a resource framework, which while valid at the time proved inadequate as subsequent reductions in spending significantly lowered resources.[2] Beyond inadequate financing, the strategy also suffered from a shortage of experience and understanding of its implementers in allocating force structure to a networked warfare environment. Inconsistent implementation of the national NEC strategy, poorly defined Mission Capability Packages (MCPs), an Industrial Age doctrinal interpretation of command and control (C2) concepts, and predominantly technically oriented development priorities toward aligning the ACR with an emerging network enabled environment in the 21st century constitute the major weaknesses in transforming ACR to an information age networked enabled force. Additionally, these deficiencies have frustrated the ACR's ability to meet national force requirements and commitments towards the development of the future NATO force.

Transforming the ACR into a 21st century information age networked enabled force will face many challenges. It is beyond the scope of this paper to identify and

address all of them. This paper will examine the viability of current C2 concepts and organizational structure in the ACR for the 21st century network enabled warfare. It will address weaknesses in key doctrinal documents related to C2 concepts, as well as gaps in the SFNEC for transforming the force to the Information Age. This paper will also recommend important doctrinal changes in C2 concepts; organizational adjustments in the ACR and alternative strategies for implementing the NEC. These changes will enhance the combat power and effectiveness of the ACR.

Recent research in C2 concepts and approaches to networked warfare invite a fundamental rethinking of the goals, priorities and procedures requisite to implementing NEC in ACR. It is becoming increasingly clear that the focus of building this capability should not fall on its technological component. Warfare is a form of human and organizational behavior; as such networked enabled warfare deals with human and organizational behavior in networked environment.[3] It is equally important to focus on changes in ways of thinking and organizational collaboration. Technology is substantial; however, it represents merely a tool and not the goal of NEC in the ACR. Intense attention needs to focus on adapting new C2 approaches and concepts, unit organizational structures, and understanding C2 in networked environment. The strategy for NEC implementation should look beyond technological enablers. It needs to address individual and organizational behavior.[4]

The Origins of Networked Enabled Capability in the Czech Armed Forces

The approval of *The Concept of Founding NEC in the Czech Armed Forces* (CFNEC) in 2004 constituted the ACR's first step in implementing the NATO NEC. Due to the lack of any previous strategic national guidance, the CFNEC drew on provisions laid out in the *NATO Strategic Vision 2004* and *NATO NEC Foundation Document*

2005.[5, 6] The CFNEC was the first conceptual document of this type in the ACR. It established six developmental areas of focus: C2 systems; personnel; technology; research and experimentation; acquisition and resourcing; and cooperation with defense industries.[7] It concluded by observing that the creation of a NEC in the ACR "is a key prerequisite for increasing the overall operational capabilities of the forces and is one of principal pillars of the transformation of ACR to a professional force."[8]

The Czech *National Security Strategy* (NSS) considers "developing technical and technological capabilities for processing and transmission of information, with an emphasis on information protection and accessibility" as an interest of national importance. [9] The NSS identified importance of achieving compatibility between the ACR and its partners by stating, "The basic principle for safeguarding the defense and security of the CR is active involvement in the NATO system of collective defense."[10] The *Military Strategy of the Czech Republic* (NMS) similarly recognizes the strategic importance of and the dependency of the CR on the Alliance. It provides that "collective defense within NATO is the only effective, efficient and credible means of defense of the CR."[11] This strategic guidance specifies the requirements for implementing technical and technological developmental programs, including a national-level NEC, in harmony with the CR's allies to achieve coherent effects in NATO operations.[12] By defining the political-military ambitions of the CR, the NMS helps determine priorities with respect to the specific units of the ACR.[13]

The recently released national strategic defense vision paper *The White Book of Defense of the Czech Republic* (WBD) elaborates these priorities in more detail. It states "cyber-defense and the ability to operate in an integrated information

environment within the framework of NATO operations are key developmental priorities" irrespective of envisioned future fiscal constraints.[14] The WBD also provides that the main concern is the units, which fall within provisions of political-military ambitions of the CR. Such strict guidance does not merely respect fiscal constraints; it signifies more importantly that primarily those units represent national commitments of the CR toward the NATO system of collective defense.

The *NATO capability statement* (NCS) prescribes required capabilities of committed national formations. It is a core Alliance paper providing guidance to all NATO member nations on units' specific capability requirements. The NCS specifies that any company-level formation serving as part of a NATO-led multinational operation must be "capable of operating integrated in an NATO NEC environment."[15] Key national strategic documents, together with allied capability requirements, supplied the Czech Ministry of Defense (MoD) valuable guidance for developing a long-term strategic approach for implementing NEC in the ACR.

In 2007, the MoD approved the SFNEC. The defense and security committee of the Czech parliament and subsequently the Czech government acknowledged the document in the fall of 2007. As with the drafting of the *Concept of Founding NEC*, the SFNEC suffered from a lack of NATO strategic and doctrinal documents on NEC. Therefore, the SFNEC had to follow provisions of *NATO Strategic Vision 2004* and *NATO NEC Foundation Document 2004*. Apart from NATO NEC conferences at the experts' level, the strategy was never the subject of any NATO strategic leaders' forums. These facts serve merely to describe the strategic circumstances, environment,

and doctrinal void, which have accompanied the evolution of NEC in all NATO member countries.

The SFNEC determines the mid- and long-term stages for creating the NEC. It details only those tasks at the mid-term stage, dividing them into three phases. In its chapter 3.1., it set out six key areas of focus completing the NEC in the mid-term: building up an integrated environment - technological site; processes of command and control; doctrinal development; education; personnel management; coordination of building up NEC.[16] Although the SFNEC elaborates on priorities in terms of technology, it does not assess resources. It does not provide requirements for organizational changes; research requirements for new C2 approaches and concepts; or any priorities toward units.[17] Significant fiscal constraints will continue to frustrate the timely realization of many particular tasks throughout SFNEC phases.[18] Thus, the SFNEC quickly became outdated and irrelevant. One of the biggest weaknesses is a broad concept of developmental priorities that is ignoring national political-military ambitions. This causes a dedication of equal focus to the strategic, operational and tactical level, while national political-military ambitions sets priorities to tactical deployable command and combat elements of the force. It ignores the guidance to focus first on implementing NEC at the battalion level for deployable units and then proceeding through to higher non-deployable formations. There is an urgent need to update and rewrite the SFNEC in accordance with outcomes of recent NATO studies, and align it with realities of assessed future fiscal resource frames and guidance provided by respective strategic documents.[19] Additionally, the SFNEC does not embed provisions of C2 approaches and concepts research. It does not shift the priority from adoption of information

technologies to developments in human and organizational behavior. Although the SFNEC recognizes the importance of the human domain, it merely provides requirements for military personnel to become information technology savvy. It does not address preconditions for change in individual and organizational behavior. Therefore, the way of thinking about the use of information has not materialized. Misunderstanding the essence of C2 in the information age and a lack of doctrinal guidance causes an unwillingness to share information and misinterpretation of C2 functions.

Examination of Command and Control Arrangements Weaknesses

Misinterpretation of C2 Functions. The central issue to the successful implementation of the SFNEC is "the need to understand C2 thoroughly."[20] Since the dissolution of Warsaw pact, the ACR has striven to break away from the Soviet understanding of C2 concepts and to adopt the NATO's conception. Admittedly, such a comprehensive undertaking has been a challenge. At the dawn of the 21st century, in the emerging age of information-networked warfare, this task looks even more challenging. Today, the ACR has neither its C2 doctrine aligned with Allied publications, nor do these documents reflect the latest research in the field of C2. The knowledge which doctrinal document provides still largely reflects an Industrial Age way of thinking about C2. The ACR's core document on Command and Control *Pub-53-01-1 Command and Control in Operations* defines C2 functions as consisting "of arrangements of personnel, material resources, communication means, signal connection, facilities, liaison activities, and procedures, which are employed by the commander in planning, directing, coordinating, and controlling operations of assigned forces pursuant to the mission assigned."[21] This is rather vague definition of C2 functions for the ACR's key doctrinal document. The document neither defines nor explains C2 functions. The lack

of explanation causes misinterpretation in practice and is an important shortcoming in the transformation of the ACR to Information Age networked warfare. This definition is more than 20 years old. Even U.S. doctrinal documents used this version of definition in the peak of the Industrial Age.[22] U.S. doctrinal documents have matured with time, incorporating new research and lessons learned; Czech doctrine, however, remains mired in a bygone era.

In their work *Understanding Command and Control,* Dr. David Alberts, and Dr. Richard Hayes, identified six functions associated with C2. These functions are "establishing intent; determining roles, responsibilities, and relationships; establishing rules and constraints; monitoring and assessing the situation and progress; inspiring, motivating, and engendering trust; training and education; and provisioning."[23] The reality is that none of the ACR's doctrinal documents in any way defines command functions. This particular absence has led to misunderstanding the core responsibilities of the commander. This results in awkward situations when commanders do not differ between command functions and control functions. Subordinates do not fulfill control functions that are associated with required adjustments to current and planned efforts within the guidelines established by command, primarily in form of intent. [24] Mislead by obscure doctrine, in practice, ACR's commanders insist on approving all possible adjustments to current and planned efforts. This results in the over-centralizing of C2 functions in one person, the commander. Consequently, it teaches subordinates that only commanders are responsible for exercising control over subordinates in all occasion. This is the true legacy of Soviet conception of C2. Such heavy *Industrial Age* behavioral runs counter to the essence of networked warfare, which aims at "supporting

the speed of command - the conversion of superior information position to action."[25] It represents one of major burdens in transforming the ACR to a military of network centric designs proposed by Arthur Cebrowski and characterized by four following concepts:

- faster, more inclusive and comprehensive bi-directional information flows among unit, particularly laterally, to enable effective operational self-synchronization at the tactical level;
- faster corporate learning;
- an ability to develop more viable options for effective action faster than an opponent; and implement viable options faster than an opponent could counter them;
- confronting an opponent with overwhelming complexity.[26]

Simply put, if there is a case for decision, it does not necessarily mean that it requires a commander to function. "When it is recognized that some adjustments are required, the function of control is to, within the limits established by command, make changes to the established roles, responsibilities, and relationships, and the rules and constraints that are in effect."[27] Unintended consequences of this way of thinking are that it prevents subordinates from developing new core competencies needed for Information Age organization like "self-synchronization and collaboration".[28] Industrial Age thinking decreases C2 quality. It results in the lack of empowerment of subordinates. Empowered subordinates can use robustly shared information for better interaction, which enhances effectiveness and agility.

Lack of Empowerment. ACR *Pub-53-01-1 Command and Control in Operations* provides that "command rests exclusively in the hands of the commander. It includes

authority, decision-making, leadership and control."[29] The document further provides that a commander is a center element of command. The commander is the "key person in the process of C2."[30] The role of a commander is "decisive for successful command and control."[31] It as well signifies traditional principles of command and control like "decomposition, centralized planning and control, and decentralized execution."[32] Such doctrinal provisions, deeply rooted in an Industrial Age way of thinking, represent another significant burden in transforming ACR to a networked warfare capable force. In their work *Power to the Edge: Command and Control in the Information Age* Dr. David Alberts, and Dr. Richard Hayes, provide that "This traditional view of command could be characterized as *power to the center*."[33] The Information Age requires a new approach to C2. "This approach is called *power to the edge.*"[34] The essence of the new approach is the empowerment of individuals and organizational entities for unlimited interaction, robust information sharing, and elimination of unnecessary C2 constraints.[35] With application of *power to the edge* C2 concepts, "military organizations will be able to overcome the shortcomings of their Industrial Age predecessors and develop the interoperability and agility necessary for success."[36] The changes need to include the way militaries think about the use of information and the power it bears in a robust network. Militaries must change the way they understand the essence of command and how they exercise control in networked warfare.

Military operations are "enormously complex, and complexity theory tells us that enterprises organize best from the bottom-up."[37] Arthur Cebrowski contended "… the new technology enables much greater military effectiveness from self-synchronization by tactical units rather than from traditional hierarchical command structures."[38]

Traditionally, however, a military commander works to obtain top-down command directed synchronization to properly mass fires at the point of contact with the enemy. The unconstrained interaction will intensify the use of information. This will result in increased speed of command, bottom-up self-synchronization, and higher situational awareness. The theorist Jeff Cares in his book *Distributed Networked Operations* refines the essence of networked centric operations. He suggests that with new C2 concepts "where power generates from robust networked enabled interaction, the fluid, self-synchronizing military force will be the norm, at least at tactical level."[39] The primary advantage in these self-synchronizing forces "arises from networked affects."[40] He discusses distributed networked operations within the concepts of adaptive control theory in an emerging complex and non-linear operational environment, and envisions combat by a large number of diverse, small units rather than by a small number of generally homogenous, large units.[41] It is important for all militaries aspiring to transform to Information Age to study this new theory for future operations and embed the gained knowledge into doctrinal documents.

Networked warfare, where decision-making information goes out to the edges, involves changes in collective behavior; in the size of units, and their efficiency. Significant will be ability of each empowered individual and organizational entity, out at the edges, in interpreting and maximizing the available information. These facts emphasize the necessity of focusing on the human domain more than merely equipping military personnel with information technologies.

Lack of Focus on the Human Domain. The SFNEC provides only vague guidance for focusing on the *Human Domain*.[42] Although it recognizes the importance of such a

domain, it merely provides the requirements for military personnel to become information technology savvy. The detailed MCPs specified in chapter 4 do not set out measures related to education, training, and exercises. MCPs do not address required changes in the ways of thinking, implications of new C2 concepts and approaches, mutual interactions, collaboration, and leadership.[43] Admittedly, the nature of networked warfare "is about human and organizational behavior."[44] Any approach, which merely focuses on combining modern information technology (IT) and the best IT educated and trained personnel, cannot be the model for Information Age networked warfare. McCann and Pigeau, authors of *Human in Command: Exploring the Modern Military Experience* assert, "equipment is useless without personnel who believe in the cause and are motivated to achieve the goals that will further it."[45] The authors summarize that "technological advances have certainly changed face and pace of C2, but these changes have occurred within a philosophical and conceptual vacuum."[46] They emphasize that with the emerging Information Age networked warfare "C2 approaches and concepts must be defined and discussed from a uniquely human perspective."[47] It will be priority for SFNEC to recognize the importance of the human domain and redefine its MCPs. Human is the key element of battle command and control; technology is only a tool. New capabilities cannot be limited merely to keeping up with technological advancement or IT literacy of military personnel. Education, training, and exercises must accurately reflect all identified changes in C2 concepts, approaches, and individual and organizational behaviors.

All players in the Information Age operating environment will use technology to cooperate in networked manner, including adversaries. Therefore, those who are

capable of making the best of available information will gain a competitive advantage and not those who use the best information technology. The theorist Alexander Kott in his book *Battle of Cognition: The Future Information-rich Warfare and the Mind of the Commander* asserts that technological advance in the C2 field "can succeed only by matching the new technology to the intricate strengths and weaknesses of the human mind."[48] It is only the human mind, which can best make sense of any situation or any problem, even in the most complex problems. The key is in acknowledging, "The mind is gifted beyond any machine - indeed, beyond its own comprehension - and it now has high-performance, distributed information systems to assist it."[49] It is important to understand how people utilize the new technological capabilities in making the most of information for supporting C2 processes. That means "enabling individuals and organizations to create value in new ways."[50] Kott asserts, "Situation awareness, collaboration, and effective decision-making are three most salient processes of successful battle action and C2."[51] In short, humans conduct these processes with support of technology, not vice versa. Kott further provides that "the quality of battle C2 is critically dependent on the extent to which the decision makers understand the situation and on the degree of cognitive load they experience."[52] Education and training efforts must concentrate on preparing military personnel to make sense of presented information better, collaborate without constraints, self-synchronize, make decisions, and communicate decision effectively.

Information has always played a key role in military operations. Ability to obtain information and process it has led to decisive information advantage over an opponent. Access to new ITs has vastly increased a force's ability to collect, process, distribute

and use information. This all signifies necessity of free information distribution, and utilizing all sources in obtaining and leveraging information in support of C2.

Constraint Distribution of Information. In concert with the book *Understanding Command and Control*, the term information for purposes of this paper includes "data, information, understanding, knowledge, and wisdom."[53] *Pub-53-01-1 Command and Control in operations* specifies that information management is an organized process. The key drivers of this process are both the commander's critical information requirements and his/her guidance related to requirements for exchanging information either vertically or horizontally.[54] This doctrinal document defines the essence of information management as an "organized process utilized for constant provisioning of important information to the right person in the right time in usable format for enhancing situational awareness and decision-making."[55] Although there is principally nothing wrong with this definition, the document further emphasizes that this is pre-dominantly a *commander-centric process*, as it serves primarily a commander with information.[56] Upon adoption of collected information, commander's staff turns information into intelligence and pushes it, respecting guidance on information exchange requirements, either vertically or horizontally to *identified* users.[57] Such doctrinal guidance is clearly a legacy of the Industrial Age militaries, which "follows this practice of preplanning organized system, and constrained distribution."[58] These doctrinal provisions require rethinking and reflection on new research outcomes conducted on the field of information distribution.

Emerging ITs can provide for large-scale information sharing information and distribution only if organizations adopt a philosophy of unconstrained collaboration and

interaction. “In a genuine Information Age (or an Edge organization), all information is available to all the entities, with constraints minimized and focused on necessary aspects of information assurance.”[59] This misunderstanding of information distribution in ACR’s C2 structure goes against Information Age opportunities. The implementation of changes in the ways of distributing information concepts will enhance shared awareness and collaboration, adding to increased synchronization. Admittedly, such “advances in the information domain … will affect progress in the cognitive domain, which in turn will be reflected in the physical domain in the form of responsiveness, adaptability, agility, and flexibility.”[60] These competencies will provide a source of competitive advantage in the Information Age.[61] The robust distribution of information and close collaboration will enable a force to “convert information to better choices and outcomes - this is called new edge *battle wisdom*.”[62] The ACR’s doctrinal documents need to provide guidance for all individuals at all levels of military organization to feel hunger for information that is available in the environment. Every soldier, military platform, and collaborating entity is a source of information. Just as they must collect information, so they must leverage the collective intelligence enabled by free and robust distribution of information.

These arguments are certainly only few of the already indentified C2 weaknesses in the SFNEC and the ACR’s other doctrinal documents. However, this is not the only area for improvement. This paper also addresses gaps in organizational structure. There are weaknesses in tactical structures of Combat Support (CS) and Combat Service Support (CSS) units. Important is as well a gap related to insufficient battle-staff

structures. These gaps as well have a potential to hamper successful transformation of ACR to future networked enabled force.

Examination of Organizational Weaknesses

Unbalanced Tactical Structures of CS and CSS Units. The ACR's current organizational structure has existed since 2003. In that year, the ACR adopted a new, modular approach for constructing deployable brigade- and battalion-size task forces. The ACR currently fields two maneuver brigades, each with four maneuver battalions. Functional CS and CSS modules are not an organic to their parent maneuver brigades or battalions. These modules exist in independent functional brigades. When directed, functional brigades provide their "earmarked" battalion or company size modules for maneuver formations. These arrangements bring several advantages, like enhanced quality and effectiveness of functional training, more efficient links from functional branches' heads at strategic level to functional units at tactical level, and flexibility in assigning functional units to maneuver formations prior identified deployments, to name a few. However, these arrangements are the main source of inconsistent implementation of a national NEC strategy. Although the SFNEC provides clear objectives through particular MCP, the focus (fiscal, educational and research) has shifted purely to maneuver brigades and battalion, and no or minimal effort has remained toward functional elements.[63] This practice results in a major technological disproportion between maneuver and functional modules. In parallel with a lack of technology comes a lack of education and training. *The 2010 Annual SFNEC Report* is the first document to identify such shortfalls and stipulate requirements for coordination and mutual coherence of all NEC implementation projects.[64] It suggests initiating, in 2012, NEC implementation projects for all functional support areas.[65] On the other hand,

the report does not recognize necessity for more proportionate and incremental MCP approach to NEC implementation.

Despite the SFNEC's provisions, both maneuver brigades and their battalions receive the new technology simultaneously.[66] The MCPs should ensure that two battalion size task force formations with all the functional support modules receive technological and educational means and attention. Subsequently a second package of two battalions should follow until all maneuver battalion size formations are completed. The air force should adopt a similar approach to its wing-size formations. This approach is consistent with national political-military ambition and ensures incremental adoption of constantly improving information technology.[67] Both fiscal constraints and the dynamic pace of new technology advancement indicate a necessity to distribute all associated costs and modernization projects in a more proportionate manner throughout several years. Although, the SFNEC emphasize such argument of a balanced adoption of new technologies and the adherence to political-military ambitions these provisions have not materialized in practice.[68] All maneuver battalion formations received simultaneously only some parts of new technology, but not the entire package. This means that all of them can fulfill only minimal operational requirements.[69]

The current structure of function-oriented units and the inconsistent implementation of the SFNEC create an even more significant problem in deployable brigades and battalion task forces. First, the battle-staff structures of these formations lack functional combat support elements, which must ensure 24/7 performance of control function. Second, these structures are composition of functional, enclosed stovepipes throughout all command levels.

Insufficient Battle-Staff Structures. The principal doctrinal document related to description of command and control concepts *PUB 53-01-2 Staff Processes in Operations* provides detailed guidance on brigade, battalion and company level command post (CP) arrangements. CP composition signifies the necessity of a specialty based organization.[70] It reflects the broadening of the future military mission spectrum and it describes the necessity to establish either permanent or ad hoc specialty- and threat-based functional groups.[71] Such a philosophy follows traditional, Industrial Age warfare C2 principles such as "decomposition, specialization, hierarchy, optimization, deconfliction, centralized planning, and decentralized execution."[72] These principles are not exclusive to the ACR. They remain important elements in most of today's military organizations.[73] However, in the face of future operational environment complexity, the broadening spectrum of missions, and the emerging needs for rapid and unconstrained information sharing these principles and practices "will not permit an organization to bring all of its information (and expertise) or its assets to bear."[74] Traditional way of thinking is not suited to realizing the Information Age key force capabilities of *interoperability* and *agility*.[75] An Industrial Age way of thinking, in principle, relies on centralized planning and the ability to specify information exchange requirements and collaboration in advance. However, in increasingly complex situations, it is impossible to know with whom and when one needs to share information in advance.[76] The organizational transformation needs to focus on changing these traditional C2 practices and adapt to an *edge organization*. Simply put, organizational transformation must focus on "mastering the art of creating and leveraging information advantage."[77] Maximum benefits of information technology "come not from automating

existing processes, but rather from developing new processes that take full advantage of the new technologies."[78] Based on the results of existing research, "… the community of researchers expects those organizations that are based on power to the edge principles and that conduct network-centric operations to be more agile."[79]

Recommendations

The leadership of the ACR and its personnel have invested a great deal of valuable effort in transforming the ACR to 21st century warfare. The ACR's success in operations with NATO allies and coalition partners, primarily in Afghanistan clearly demonstrates this. This paper provides some recommendations to assist the ACR leadership in intensifying the process of force transformation and aligning the force with allies. This paper also draws attention to the risks associated with the proposed changes, enabling the ACR leadership to make sound decisions. These recommendations relate to MCPs in strategy for NEC implementation, organizational changes of the ACR, and doctrinal changes in C2 concepts.

Revision of NEC Strategy - Resetting MCPs. A sound and coherent MCP should consist of concept of operations (ConOps), C2, organization, doctrine, education, weapons, and infrastructure, systems, and personnel.[80] The SFNEC determines three MCPs to achieve the transformation of the ACR into a 21st century information age networked enabled force.[81] They provide detailed goals for the adoption of new information technologies, for embedding staff procedures and include training for mastering information technology. However, they do not specify goals for changes in ConOps and C2 approaches. MCP's do not set research requirements for new C2 approaches and concepts and goals for doctrinal adoption of available knowledge related to C2 concepts in networked warfare. They do not embrace need for

organizational changes, changes in procedures and behavior, and any priorities toward units. Therefore, the revised SFNEC should provide these specific goals and to redefine the MCPs.

Strategy through reviewed MCPs must determine the specific goals concerning the education and training of personnel to include new C2 concepts and ways of thinking. It must require revision of doctrinal documents to reflect on research based Information Age C2 concepts and approaches. Education and training comprising of new C2 concepts, approaches and way of thinking must become a priority. To better harness the power of new emerging technologies, the SFNEC must set the conditions for the incremental and balanced modernization and adoption of new technologies for battalion-size formations, including functional CS and CSS modules. MoD must avoid the massive, an all-at-once, single employment of systems for all maneuver elements. An incremental approach will better address all deployable formations, and achievements of final operational capability requirements in accordance with political-military ambitions.

The disadvantages associated with widening the scope of the MCPs in the SFNEC relate to an increase of fiscal resources in the initiation phase, as there will be a need for more training and education courses related to new C2 concepts, approaches and way of thinking. It will require a radical change in the composition of the courses and entities participating in their organization. Extensive cooperation with civilian contractors prior the development of trained instructors and lecturers will also be essential, as with reviewing mid-term research and innovations plans and enhancing the

research focus. However, the adoption of battalion wise incremental modernization approach, instead of current mass approach could mitigate the risk of fiscal increase.

Transforming the Organizational Structure of the ACR. The current modular organizational structure of the ACR is the main source of inconsistent implementation of a national NEC strategy. It is necessary to provide functional CS and CSS modules the same capability as maneuver modules. Presently, they do not receive the same developmental priority from the strategic level.[82] This must change. In addition to confusing the implementing of the SFNEC, this structure increases the routine sustainment cost of the ACR because functional brigade headquarters (HQs) are non-deployable.[83] These HQs serve merely as the peacetime administrative C2 elements of their subordinate deployable modules.[84] The MoD must rethink the functional brigade based model. It should dismantle the functional brigades and redistribute the functional CS and CSS battalions equally into both maneuver brigades, as obtained before December 2003. These steps will facilitate political-military ambitions, preserve the capacity to generate deployable formations, and maintain the concept of modular, task driven deployable formations. Additionally, it will offer the potential of considerable fiscal savings for other projects. Most importantly, it will focus development priorities in both the maneuver and functional modules, and enhance interoperability, combat power, and the effectiveness of the deployable formations.

These proposed organizational structure changes will require yet another painful force restructuring. The Chief of Defense has many times declared his concerns in relation to the structural stability of the force and therefore the benefits of such force reconstruction will need thorough deliberation. Further, dismantling of functional

brigades' commands from the force structure will result in a decrease of experienced, senior and mid-ranking personnel from the brigades' leadership and staff. However, there is a reasonable space to enlarge maneuver brigades' staff; the JFC's and MoD's functional staff cells, which are at present significantly undermanned in numbers and capabilities. This will strengthen effectiveness of maneuver brigades' staffs and overall C2 processes. Additionally, there is an arithmetical prediction of fiscal saving in regards to lowering the numbers of personnel, equipment and the usage of infrastructure.

Revision of Doctrinal Documents - Embedding New C2 Concepts. The most significant problem the ACR faces in transformation itself is outdated and unclear C2 doctrinal principles. The doctrinal C2 documents of PUB 53 - 01 series must reflect on recent research findings and foreign military operation lessons learned. Education, training and exercises intimately flow from doctrine. This implies that the changes in way of human thinking must start with doctrinal changes. Doctrine must reengineer C2 concepts, clearly specifying command functions, control functions, and the role of commander and organization in a networked environment. It must provide guiding principles for NEC and power to the edge C2 concepts to enable organization to leverage the power of information. The doctrine must inculcate in the military mind the value intuition, rational reasoning of complex situations, collaboration, interaction, problem comprehension, and "self-learning to improve the use of information and decision-making."[85]

Concurrently with doctrinal changes, cultural changes will encourage organizational behavior to support the application of new ways of thinking and outlive the old ones. The MoD must ensure that education programs, training and exercises

apply the new C2 concepts and approaches while intensively utilizing information technology. Doctrinal and cultural changes represent the biggest challenge in transforming the force in 21st century. It will require vast shift in thinking about C2 approaches and concepts. Leaders will need to push down decision-making authority to lower levels; and foster mutual trust across all levels of command. Primarily long-serving personnel in the MoD, responsible for education, training, and doctrinal development, will be first to initiate this shift. There will be requirement for language improvements as majority of C2 research bibliography is available only in English. Additionally, the MoD leadership will need to create an atmosphere of urgency in the ACR for NEC Information Age culture. Initial and subsequent constant seminar like education will have to be established, which will stretch already tight working hours at the strategic and operational levels. The proposed recommendations will enable the force to become valuable member of multinational formations throughout the entire likely spectrum of operations in the security environment of the 21st century.

Conclusions

The Czech strategic documents provide the guidance that signifies the need for making the ACR a smaller, more effective military force, fully interoperable in a multinational environment. The MoD, in its transformation plans relies on the use of high-technology command, control, communications, computers, and intelligence systems (C4I) to leverage its military assets. [86] Advanced Information technology has the potential to enhance combat power and the effectiveness of the force. Information technology advances without changes in organization structure, C2 approaches and concepts, organizational culture and doctrine, however great, would merely mean higher expenses and a marginal enhancement of capabilities. The MoD must strive to

fix weaknesses primarily in the human developmental and doctrinal areas. A strategy for the NEC must provide a long-term vision through well-thought and balanced MCPs. Although, there are risks associated with a shift in strategy for NEC and organizational structure, they are marginal in comparison with the prospect of enhanced future force effectiveness. The MoD needs to create an atmosphere of urgency for NEC implementation and necessity to accommodate network enabled Information Age culture. There must persistently push for change in human and organizational behavior to exploit fully the opportunity for information superiority. Only through long-term sustained actions in all these areas will the ACR achieve its transformation force goals for the 21st Century.

Endnotes

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